

# इंटरनेट

# मानक

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Mazdoor Kisan Shakti Sangathan

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“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 7422-5 (1992): Symbols and abbreviations for use in geological maps, sections and subsurface exploratory logs, Part 5: Line symbols for formation contacts and structural features [WRD 5: Geological Investigation and Subsurface Exploration]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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भारतीय मानक

भूवैज्ञानिक, नक्शे, खंड और उपसतह सम्बन्धित लॉग में  
प्रयुक्त प्रतीक और संक्षिप्तियाँ

भाग 5 रचना, सम्पर्क तथा संरचनात्मक आकृतियों के लिए रेखिक प्रतीक

*Indian Standard*

# SYMBOLS AND ABBREVIATIONS FOR USE IN GEOLOGICAL MAPS, SECTIONS AND SUB-SURFACE EXPLORATORY LOGS

PART 5 LINE SYMBOLS FOR FORMATION CONTACTS AND  
STRUCTURAL FEATURES

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**BUREAU OF INDIAN STANDARDS**  
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## FOREWORD

This Indian Standard ( Part 5 ) was adopted by the Bureau of Indian Standards, after the draft finalized by the Geological Investigation and Sub-Surface Exploration Sectional Committee had been approved by the River Valley Division Council.

In all spheres of engineering construction, data on the nature of geological formation, constituting the foundations is indispensable. Often, the data are given on maps or in geological sections using symbols and abbreviations. Geological maps and sections are also required for other activities such as mining and mineral prospecting. Such maps and sections are being prepared by various agencies in the country. In the absence of any standard for the guidance of the engineering geologist or engineer different symbols and abbreviations are being used by different agencies, resulting in entirely different representations of the same geological data. The data collected and presented by one agency for a particular purpose is often useful for other agencies investigating for a different job. It, therefore, becomes essential for all agencies to follow the same practice. This standard has been prepared to fulfil this need.

This standard ( Part 5 ) deals with line symbols for formation contacts and structural features while other parts deal with the following:

- Part 1 Abbreviations
- Part 2 Igneous Rocks
- Part 3 Sedimentary Rocks
- Part 4 Metamorphic Rocks

# *Indian Standard*

## SYMBOLS AND ABBREVIATIONS FOR USE IN GEOLOGICAL MAPS, SECTIONS AND SUB-SURFACE EXPLORATORY LOGS

### PART 5 LINE SYMBOLS FOR FORMATION CONTACTS AND STRUCTURAL FEATURES

#### 1 SCOPE

1.1 The symbols covered in this standard are:

- a) Line symbols for formation contacts and other structural features,
- b) Symbols for surface openings and exploration,
- c) Symbols for underground working and exploration, and
- d) Other miscellaneous symbols.

#### 2 BASIC PRINCIPLES OF REPRESENTATION

2.1 The symbols used are intended to characterize the existing state as found in nature and shall not be used to represent genetic processes and their connections.

2.2 The tectonic elements can be regarded as surfaces or lineations characterized by their situations in space.

##### 2.2.1 Planes

Tectonic planes are represented by their traces in the reference plane.

The basic symbol for traces is a continuous line to which additional symbols characterizing the nature of the surface are added.

##### 2.2.2 Lineation

Lineations are represented by their projection on the reference plane.

The basic symbol for the projection of lineations is a compound line of alternate dots and dashes to which additional symbols characterizing the nature of the lineations in question are added.

##### 2.2.3 Indication of Position

The position of the planes and lineations are given by the oriented representation of their traces and projections on the map or plan.

#### 3 LINE SYMBOLS FOR FORMATION, CONTACTS AND STRUCTURAL FEATURES

3.1 The line symbols representing formation contacts and various structural features are given in tabular form as listed below:

a) Contacts	Table 1
b) Faults	Table 2
c) Folds	Table 3
d) Planar features	Table 4
e) Line features	Table 5
f) Slip planes and minor shear seams	Table 6
g) Contours and isopleths	Table 7

#### 4 SYMBOLS FOR SURFACE OPENINGS AND EXPLORATION

4.1 The symbols representing surface openings and exploration are given in tabular form as listed below:

a) Symbols for use in large scale maps	Table 8
b) Symbols for use in small scale maps	Table 9

#### 5 SYMBOLS FOR UNDERGROUND WORKING AND EXPLORATION

5.1 The symbols representing underground workings and such exploration are given in Table 10.

#### 6 OTHER MISCELLANEOUS SYMBOLS

6.1 Symbols for sections, waterwells and springs and other miscellaneous items are given in Table 11.

Table 1 Line Symbol for Contacts  
(Clause 3.1)


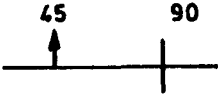
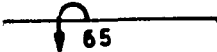

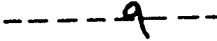




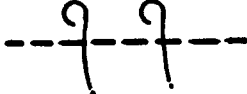


Sl No.	Description	Symbol
1	Contact	
2	Contact, showing dip, vertical contact with topside known	
3	Overturned contact, showing dip	
4	Approximate contact	
5	Possible contact	
6	Concealed contact	

Table 2 Line Symbol for Faults  
(Clause 3.1)

Sl No.	Description	Symbol
1	Fault	
2	Fault, showing dip	
3	Fault, approximately located	
4	Fault, inferred or doubtful	
5	Concealed fault	
6	Lineament	

( Continued )

Table 2 Line Symbol for Faults (Concluding)


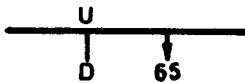

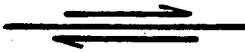


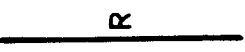



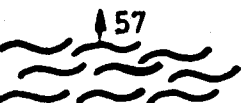
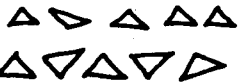
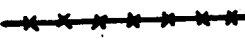

Sl No.	Description	Symbol
7	Fault (showing bearing and plunge of grooves, striation or slickensides)	
8	Fault, showing dip (U-upthrown side D-downthrown side)	
9	Fault (bar & ball on downthrown side)	
10	Fault showing relative horizontal movement	
11	Fault (showing bearing & plunge of apparently downthrown block)	
12	Normal fault (hachures on downthrown side)	
13	Reverse fault (R, upthrown side)	
14	Thrust fault (T, upper plate)	
15	Thrust fault (sawteeth on upper plate, major thrust fault)	
16	Overtured thrust fault, sawteeth in dip direction, bar on side of tectonically higher plate	
17	Fault (shear or mylonite) zone showing dip	
18	Fault breccia	
19	Fault, intruded by dyke	
20	Termination of fault	



Table 3 Line Symbols for Folds  
(Clause 3.1)

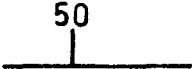
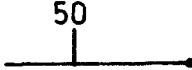
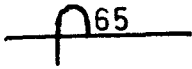
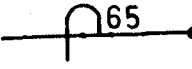




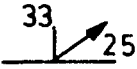
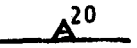


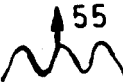
Sl No.	Description	Symbol
1	Anticline, showing crestline	
2	Anticline showing crestline & direction of plunge	
3	Anticline showing crestline & plunge	
4	Asymmetric anticline showing crestline & plunge, shorter arrow indicates steeper limb	
5	Asymmetric anticline showing dip of limbs & plunge	
6	Overtaken anticline showing direction of dip of limbs & plunge	
7	Inverted anticline, Arrows show direction of dip of limbs	
8	Dome	
9	Antiform	
10	Syncline showing troughline	
11	Syncline showing troughline and direction of plunge	
12	Syncline showing troughline and plunge	
13	Asymmetric syncline showing trough line and plunge. Short arrow indicates steeper limb	

( Continued )

Table 3 Line Symbols for Folds ( Concluding )



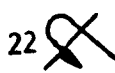

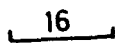



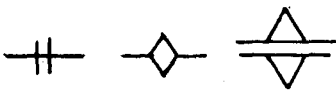

Sl No.	Description	Symbol
14	Asymmetric syncline showing dip of limbs and plunge	
15	Overtaken syncline showing dip of limbs and plunge	
16	Basin	
17	Inverted syncline, arrows show direction of dip of limbs	
18	Synform, drawn on foliation, cleavage or bedding	
19	Monocline showing trace and plunge of axes, dashed where approximately located	
20	Anticlinal bend showing trace and plunge of axis. Dashed where approximately located	
21	Synclinal bend showing trace and plunge of axis. Dashed where approximately located	
22	Minor anticline, showing plunge	
23	Minor syncline, showing plunge	
24	Minor fold axis, showing plunge	
25	Minor fold axis, horizontal	
26	Minor folds showing plunge of axes	

Table 4 Planar Features  
(Clause 3.1)

Sl No.	Description	Symbol
1	Strike and dip of beds	
2	Strike and dip of beds (Top beds known from sedimentary features, used only in areas of complex structure where overturning is also recognized)	
3	Strike and dip of overturned beds	
4	Strike and dip of overturned beds (top of beds known)	
5	Strike of vertical beds (top of beds known)	
6	Strike of vertical beds	
7	Component of dip (dot marks point of observation)	
8	Horizontal beds	
9	Strike and dip of beds and plunge of slicken-sides	
10	Strike and dip of foliation	
11	Strike of vertical foliation (relationship of foliation, or schistosity, to bedding not shown in outcrop)	
12	Horizontal foliation	
13	Crumpled, plicated, crenulated, or undulatory beds and average dip	

(Continued)

Table 4 Planar Features (Concluding)

Sl No.	Description	Symbol
14	Strike and dip of foliation and parallel bedding	
15	Strike of vertical foliation and parallel bedding	
16	Strike and dip of foliation and parallel bedding	
17	Horizontal foliation and bedding	
18	Strike and dip of cleavage	
19	Strike of vertical cleavage	
20	Horizontal cleavage	
21	Inclined vertical	
22	Vertical	
23	Horizontal	

(Contrasting symbols can be used to distinguish between different kinds of planar structures) :  
Type of planar structure should be specified in explanation.

Table 5 Line Symbols for Linear Features  
(Clause 3.1)

Sl No.	Description	Symbol
1	Bearing and plunge of lineation	
2	Vertical lineation (use open symbol in combination with line symbols)	
3	Vertical beds, showing horizontal lineation	
4	Horizontal beds, showing trend of horizontal lineation	
5	Vertical beds showing plunge of lineation	
6	Horizontal lineation	
7	Strike and dip of foliation and plunge of lineation	
8	Vertical foliation showing horizontal lineation	
9	Strike and dip of foliation showing horizontal lineation	
10	Strike and dip of beds and plunge of lineation	
11	Vertical foliation and vertical lineation	
12	Strike of vertical foliation showing plunge of lineation	
13	Approximate strike of folded beds showing plunge of fold axes	
14	Attitude of overturned beds and parallel foliation	

( Continued )

**Table 5 Line Symbols for Linear Features ( Concluding )**

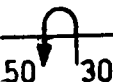

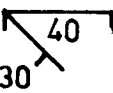
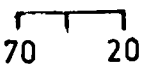
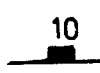


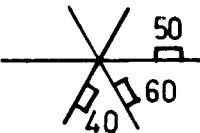
SI No.	Description	Symbol
15	Attitude of foliation and overturned beds, strikes parallel but dips differ	
16	Double lineation	
17	Strike and dip of beds and intersecting slip cleavage (symbols joined at points of observation)	
18	Strike and dip of beds and intersecting slip cleavage	
19	Strike and dip of joints	
20	Strike of vertical joints	
21	Horizontal joints	
22	Strike and dips of multiple joints	

Table 6 Line Symbols for Slip Planes and Minor Shear Seams  
(Clause 3.1)

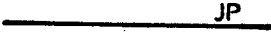




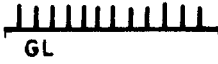
Sl No.	Description	Symbol
1	Joint plane	
2	Slip plane	
3	Shear zone — 1 to 5 cm (thick crushed rock)	
4	Shear zone — 5 cm to 15 cm (thick crushed rock)	
5	Shear zone — thickness of zone defined by border lines	
6	Glide crack	

Table 7 Lines Symbols for Contours and Isopleths  
(Clause 3.1)

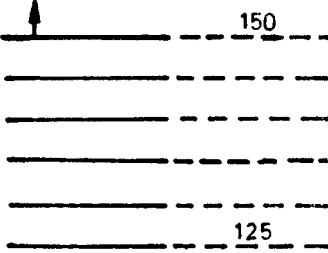







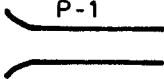

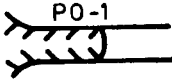
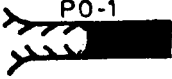
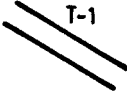

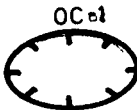

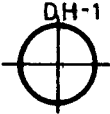








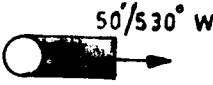


Sl No.	Description	Symbol
1	Structure contours Drawn on top (or base) of given geological horizon, long-dashed where control less accurate, short-dashed where datum is above land surface, contour interval 5 m, arrow indicates direction of dip. (Structure contours generally not shown as concealed; may be omitted in areas of no information. Arrows used only where index contours fail to show dip.)	
2	Outcrop point used for structural control	
3	Isopachs	
4	Isograds (add key mineral names to map and describe in explanation)	







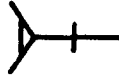
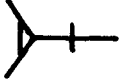
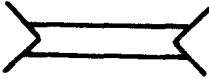









Table 8 Symbols for Surface Openings and Exploration for  
Use in Large Scale Maps  
(Clause 4.1)

Sl No.	Description	Symbol	
1	Vertical shaft		
2	Inclined shaft		
3	Portal or slit		
4	Portal or opencut		
5	Trench		
6	Prospect pit or opencut		
7	Drill hole (up to and including 150 mm)		
8	Drill hole, large diameter (more than 150 mm)		
9	Drill hole (no geological data available)		
10	Auger hole (up to and including 150 mm)		
11	Auger hole, large diameter (above 150 mm)		
12	Drill hole, inclined (Showing bearing and inclination for surface)		
13	Mine dump		

NOTE – Wherever two symbols are given, the left hand figure denotes the proposed and the right hand figure, the completed working.

Table 9 Symbols for Surface Openings and Exploration for  
Use in Small Scale Maps  
(Clause 4.1)

Sl No.	Description	Symbol	
1	Vertical shaft		
2	Inclined shaft		
3	Portal of tunnel, adit or slope		
4	Inaccessible tunnel, adit or slope		
5	Trench		
6	Prospect pit		
7	Sand, gravel, clay or placer pit		
8	Mine, quarry, glory hole or open pit		

NOTE – The left hand figure denotes the proposed, and the right hand figure, the completed working.

Table 10 Symbols for Underground Workings and Exploration  
(Clause 5.1)













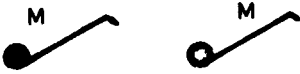
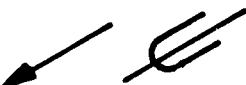

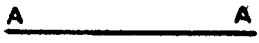
Sl No.	Description	Symbol
1	Shaft at surface	
2	Shaft, above and below level	
3	Bottom of shaft (show bottom of pump by note on map of lower level)	
4	Winze or head or raise	
5	Raise or winze extending through level	
6	Raise or foot of winze	
7	Stopes (can also be explained by note 'stoped above' or 'stoped below')	
8	Oil well	
9	Shaft or dig	
10	Dry hole (showing formation and altitude at surface, formation at bottom of hole and total depth)	 <div><div>Km 350</div><div>Kd 450</div></div>

Table 11 Symbols for Sections, Water Wells and Springs  
and Other Miscellaneous Items  
(Clause 6.1)

Sl No.	Description	Symbol
1	Thrust (Arrow shows relative direction of movement)	
2	Fault (Arrow shows relative direction of movement)	
3	Fault, showing lateral movement (T towards observer; A away from observer, may be combined with arrows to show strike slip and dip slip movement)	
4	Drill hole or well on section (showing surface altitude and depth in m, angle of deviation from vertical plotted)	
5	Drill hole or wall projected to section (showing surface altitude and total depth in m)	
6	Nonflowing well	
7	Flowing well	
8	Test hole, abandoned or not in use	
9	Nonflowing well with pumping plant [Generally shown on blue (drainage) base plate in ground-water and surface-water reports]	
10	Flowing well with pumping plant	

( Continued )

Table 11 Symbols for Sections, Water Wells and Springs  
and Other Miscellaneous Items ( *Concluded* )

Sl No.	Description	Symbol
11	Spring	
12	Thermal spring	
13	Mineral spring	
14	Glacial striae	
15	Line of stratigraphic section	
16	Line of section (generally omitted from explanation; used only to avoid confusion with other line)	

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